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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/037,460 03/10/98 HASTINGS

G 325800-626 (P)

022195
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HM12/0921

EXAMINER

SAOUD.C

ART UNIT

PAPER NUMBER

1647

31

DATE MAILED:

09/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.
09/037,460

Applicant(s)
HASTINGS et al.

Examiner
Christine Saoud

Art Unit
1647



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jul 16, 2001
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 54-67, 75-92, 102-107, 115-119, and 122-176 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 54-67, 75-92, 102-107, 115-119, and 122-176 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other: _____

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 16 July 2001 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/037,460 is acceptable and a CPA has been established. An action on the CPA follows.

Response to Amendment

2. Claims 146 and 173 have been amended and claim 176 has been added as requested in the amendment of paper #30, filed 16 July 2001. Claims 54-67, 75-92, 102-107, 115-119, and 122-176 are pending in the instant application.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Any objection or rejection of record which is not expressly repeated in this action has been overcome by Applicant's response and withdrawn.

5. Applicant's arguments filed 16 July 2001 and 15 May 2001 (paper #27) have been fully considered but they are not deemed to be persuasive.

Claim Rejections - 35 USC § 101

6. Claims 54-67, 75-92, 102-107, 115-119 and 122-176 are rejected under 35 U.S.C. 101 because the claimed invention is drawn to an invention with no apparent or disclosed specific and substantial credible utility for the reasons of record in paper #20 and 24. The instant application has provided a description of an isolated DNA encoding a protein and the protein encoded thereby. The instant application does not disclose the biological role of this protein or its significance.

Applicant argues in paper #27 that they only need to make one credible assertion of specific utility for the claimed invention to satisfy 35 USC 101 and 112. This argument is not correct, because the assertion must be a specific, substantial and credible utility (Applicant failed to mention the substantial aspect of utility). Applicant continues to argue that the Examiner has not met the initial burden of establishing why one of ordinary skill in the art would reasonably doubt Applicant's assertions. This argument is not persuasive, because as pointed out before, Applicant's assertion of function based on sequence relatedness is not sufficient for establishing utility, and one of ordinary skill in the art would reasonably doubt such an assertion based on this data because it is clear from the art at the time of the instant invention that function cannot be predicted from structure alone.

Applicant asserts that the specification describes the function of VIGF. This assertion is not persuasive, because although the specification asserts a function for the disclosed protein, this assertion is not based on any facts or evidence to support such a conclusion. As indicated in the previous Office action, a conclusion of biological activity based on amino acid structure alone is

not sufficient to support such an assertion because the prior art establishes that amino acid structure alone is not predictive of function. Applicant asserts that the claimed invention could be used for proliferation of vascular smooth muscle and endothelial cells. This assertion is without a basis in fact, because the claimed invention could just as likely inhibit cell proliferation, could act on different cell populations, or could possess a different biological activity which is not disclosed in the specification. Although it would appear that the origin of the claimed invention evolutionarily is related to the CCN family of proteins, this does not establish a utility for the claimed invention because one cannot predict its biological function or significance by mere amino acid sequence similarity. Skolnick et al. (Tibtech. 18: 34-39, 2000) state that “[k]nowing the protein structure by itself is insufficient to annotate a number of functional classes and is also insufficient for annotating the specific details of protein function.” (see Box 2, page 36). The proteins of this family mediate a variety of activities, which depend on the tissues in which they are expressed and upon which receptor is bound and which second messenger system is activated. This information is not present in the instant specification and cannot be gleaned from the amino acid sequence of the polypeptide which is claimed. Yan et al. (Science 290: 523-527, 2000) describe two proteins, which are clearly related, which differ by two amino acids. This difference results in binding to two distinct receptors with different biological functions as a result. The instant invention differs from the protein of the prior art by as much as 60%, therefore, one of ordinary skill in the art would not be able to reasonably conclude which biological function of the CCN family, if any, would be possessed by the claimed invention with any certainty because amino acid structure is not predictive of function. Therefore, the evidence as a whole does not

equate to a conclusion that the asserted utility is more likely than not true; contrary, the evidence as a whole does not support any specific, substantial and credible utility for the claimed invention. Applicant's assertion that the disclosed homology between the claimed invention and the CCN family is evidence of utility is not persuasive for the reasons provided above and because the record fails to establish a common utility for proteins which are structurally related to CCN. Applicant has not provided a reasonable correlation between the amino acid sequence of the claimed invention and any specific, substantial and credible use for the invention. The class of proteins to which the claimed invention is asserted to belong does not possess a specific, substantial and credible utility because the utilities of each member depends on a number of factors which cannot be predicted from amino acid sequence information alone (i.e. receptor binding, tissue distribution, physiological effect, etc.), absent evidence to the contrary.

Applicant asserts that the specification discloses many therapeutic applications for the claimed invention. However, there is absolutely no evidence of record or any line of reasoning that would support a conclusion that the vascular IBP-like growth factor (VIGF) of the instant application can be used for wound healing and associated therapies, for enhancement of growth of vascular smooth muscle and endothelial cells, and therapeutically in ischemic tissues and for coronary stenosis (see page 19 of the specification) for the reasons provided above. There is no evidence of record that the instant invention is related (i.e. no reasonably correlation) to any of the diseases indicated (i.e. muscle wasting, osteoporosis, implant fixation, tissue regeneration, etc.), and therefore, there is no evidence to support use of the claimed invention as a therapeutic agent for treating any of these conditions.

7. Claims 54-67, 75-92, 102-107, and 115-119, and 122-176 are rejected under 35 U.S.C. §112, first paragraph, as failing to adequately teach how to use the instant invention for those reasons given above with regard to the rejection of these claims under 35 U.S.C. §101 for the reasons of record in papers #20 and 24.

Applicant argues that because the invention has utility, then this rejection should be withdrawn as well. This argument is not persuasive for the reasons provided above, and therefore, is maintained.

8. Claim 176 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 176 is directed to a polynucleotide encoding a polypeptide which “consists of amino acids +1 to +163 of SEQ ID NO:2, in which 1 or more amino acid residues are substituted, deleted or added, in any combination”. These two recitations are inconsistent with one another, because if the polypeptide is to consist of a particular sequence of amino acids, it is not clear how it can also have modifications of that sequence. Furthermore, the claim encompasses modification of up to every amino acid in the sequence, therefore, it would no longer “consist” of the sequence of SEQ ID NO:2. Therefore, the claims are completely confusing in that it is not clear if the polypeptide consists of a particular sequence, or if it does not consist of that sequence.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 176 is rejected under 35 U.S.C. 102(b) as being anticipated by Bradham et al. (J. Cell Biol. 114(6): 1285-1294, 1991).

Claim 176 encompasses polynucleotides encoding polypeptides which have any number of amino acid substitutions, deletions, additions, or combinations thereof. Therefore, the claim encompasses any isolated polynucleotide in existence. Therefore, the polynucleotide of Bradham et al. anticipates the instant claim (see Figure 8A).

Conclusion

11. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Saoud, Ph.D., whose telephone number is (703) 305-7519. The examiner can normally be reached on Monday to Friday from 7AM to 3PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz, can be reached on (703) 308-4623.

Certain papers related to this application may be submitted to Technology Center 1600 by facsimile transmission. Papers should be faxed to Technology Center 1600 via the PTO Fax Center located in Crystal Mall 1 (CM1). The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. § 1.6(d)). NOTE: If Applicant *does* submit a paper by fax, the original signed copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers.

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Official papers filed by fax should be directed to (703) 308-4556. If this number is out of service, please call the Group receptionist for an alternate number. Faxed draft or informal communications with the examiner should be directed to (703) 308-0294. Official papers should NOT be faxed to 308-0294.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

September 20, 2001

**CHRISTINE J. SAUD
PRIMARY EXAMINER**

Christine J. Saud